What is claimed is:

1. A method for determining a three-dimensional surface profile of an object comprising a plurality of object points, the method comprising:

(a) providing a grating projector to direct an incident beam of light having a pattern at the object;

(b) receipt and storage of a resultantly formed grating image of a line profile of the object by a multi-line photoelectric image device;

(c) shifting the object opposite to a phase shifter, wherein the grating projector and the multi-line photoelectric image device are taken together to form the phase shifter;

(d) repeating steps (a) to (c) until all object points are imaged on the multi-line photoelectric image device; and

(e) determining a phase of each object point, and transforming and rectifying the phase to a height by an appropriate trigonometric algorithm to be viewed on a display device.

2. The method of claim 1, further comprising, before step (e), rectifying optical vigetting and uniformly rectifying different pixel responses for the multi-line photoelectric image device.

3. The method of claim 1 wherein shifting the object opposite to a phase shifter is a relative motion between the object and the phase shifter.

4. The method of claim 1 wherein the pattern is a striped sinusoidally varying intensity pattern, a sinusoidally varying intensity pattern, or a pattern made by the Moire method.

5. The method of claim 1 wherein the multi-line photoelectric image device is arranged by a plurality of CCD elements, CMOSs or photo diodes.

6. The method of claim 1 wherein the multi-line photoelectric image device comprises a plurality of photoelectric elements arranged in an array structure.

7. A system for determining a three-dimensional surface profile of an object comprising a plurality of object points, the system comprising:

a phase shifter comprising:

at least one grating projector to direct an incident beam of light having a pattern at the object; and

a multi-line photoelectric image device;

wherein the relative position between one of the grating projectors and the multi-line photoelectric image device must be fixed, and the object is shifted opposite to the phase shifter to obtain a plurality of scan images; and

a processor for determining a plurality of phases according to the scan images, and transforming the phases to the three-dimensional surface

profile of the object by an appropriate trigonometric algorithm.

8. The system of claim 8, further comprising a display coupled to the processor for displaying the three-dimensional surface profile of the object.

9. The system of claim 8 wherein, for the multi-line photoelectric image device, rectification procedures for optical vigetting and uniformity for different pixel response are performed in the processor.

10. The method of claim 8 wherein shifting the object opposite to a phase shifter is a relative motion between the object and the phase shifter.

11. The method of claim 8 wherein the pattern is a striped sinusoidally varying intensity pattern, a sinusoidally varying intensity pattern, or a pattern made by the Moire method.

12. The method of claim 8 wherein the multi-line photoelectric image device is arranged by a plurality of CCD elements, CMOSs or photo diodes.

13. The system of claim 8 wherein the multi-line photoelectric image device comprises a plurality of photoelectric elements arranged in an array structure.